

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Kenneth A. MCQUEENEY, et al

Application No.: 10/772,395

Filed: February 06, 2004

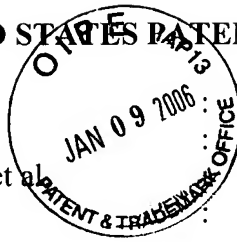
For: COIL-ON PLUG CAPACITIVE SENSORS AND PASSIVE COIL-ON PLUG
DIAGNOSTIC SYSTEM INCORPORATING SAME

Customer Number: 20277

Confirmation Number: 5026

Group Art Unit: 2858

Examiner: Jeff W. NATALINI



LETTER TRANSMITTING
INTERNATIONAL PRELIMINARY EXAMINATION REPORT

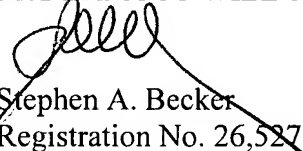
Mail Stop OIPE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is the International Preliminary Examination Report issued by the
European Patent Office concerning PCT/US2005/002687, filed February 1, 2005.

Respectfully submitted,

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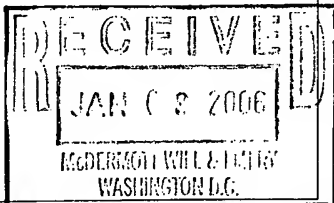
PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

BECKER, Stephen A.
McDermott, Will & Emery LLP
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Washington, DC 20005-3096
ETATS-UNIS D'AMERIQUE



NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(PCT Rule 71.1)

Date of mailing
(day/month/year)

28.12.2005

Applicant's or agent's file reference
66396-216

IMPORTANT NOTIFICATION

International application No.
PCT/US2005/002687

International filing date (day/month/year)
01.02.2005

Priority date (day/month/year)
06.02.2004

Applicant
SNAP-ON INCORPORATED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international
preliminary examining authority:



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 66396-216	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/US2005/002687	International filing date (day/month/year) 01.02.2005	Priority date (day/month/year) 06.02.2004	
International Patent Classification (IPC) or national classification and IPC F02P17/00, H05K7/12, B25B5/16, F02P17/12			
Applicant SNAP-ON INCORPORATED et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 20.07.2005		Date of completion of this report 28.12.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Olivieri, E Telephone No. +49 89 2399-	



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2005/002687

Box No. 1 Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-24 as originally filed

Claims, Numbers

1-21 as originally filed

Drawings, Sheets

1/9-9/9 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2005/002687

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation to restrict or pay additional fees, the applicant has:
- ☐ restricted the claims.
 - ☒ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☐ neither restricted nor paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with.
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
 - ☐ the parts relating to claims Nos. .

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-21
	No: Claims	1
Inventive step (IS)	Yes: Claims	2-9,19
	No: Claims	1,10-18,20,21
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2005/002687

Box No. VI Certain documents cited

1. Certain published documents (Rule 70.10)
and / or
2. Non-written disclosures (Rule 70.9)
see separate sheet

Re Item IV

Lack of unity of invention

1. The application lacks unity (Rule 13 PCT) for the reasons already described in the Supplementary Sheet B in the International Search Report.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Closest Prior Art

2. Reference is made to the following document:

D1 = DE 37 05 692 A

D2 = EP 1 088 989 A

D3 = US 4 402 481 A

D4 = US 5 461 315 A

D5 = EP 0 723 078 A

Claim 1

3. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and shows (figure 3) capacitive sensor (21) for ignition testing apparatus having a biasing element (23) and at least two portions (20, 22). which are substantially planar and could rotate and/or translate relative to each other.

The subject-matter of claim 1 is therefore not new (Article 33(2) PCT).

Claim 10

4. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 10 is not inventive in the sense of Article 33(3) PCT.

Problem positioning a capacitive sensor for diagnosing an ignition system is also well-known from D2. Here (paragraphs 50, 59) it is suggested to use different type of positioning and/or affixing means holding the sensor in close proximity to the

coil of the coil on plug. D2 does not go much in details (except for fig. 1) and does not describe the clamping or holding device.

D3 describes (figure 1; column 1, lines 7-13) an holding articulated device, which is suitable for holding a sensor during a diagnostic test on vehicle. This very well-known device is commonly used in measurement testing for to positioning, orienting and holding a sensor. The device has a magnetic mount base with a movable arm, at whose end a sensor could be fixed. The magnetic base can be selectively fixed on different parts of the vehicle chassis and the movable arm offers an comfortable positioning and holding feature.

Therefore the skill man in the art, in order to satisfy the need of holding the capacitive sensor of D2, would combine the sensor with the holding mean of D3. In this way the capacitive sensor could be easily held in proximity of the coil of the coil on plug.

The subject-matter of claim 10 is therefore not inventive (Article 33(3) PCT).

Claim 17

5. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 17 is not inventive in the sense of Article 33(3) PCT.

D4 shows a control circuit for ignition testing apparatus (figure 3) comprising a capacitor (C1) comprised in a capacitive divider and a potentiometer (R2), which permits the attenuation and the calibration of the sensor signals (column 4, lines 6 to 17).

D4 differs from the present application in that, it does not comprise a first and a second plurality of input electrical connectors belonging to a first and second circuit region respectively.

D5 shows (figures 4A, 4B) a further control circuit for ignition testing apparatus having a plurality of input electrical connectors connected to one side to a plurality of capacitive sensors and on the other side to the circuit of the diagnostic apparatus. This configuration allows the use of many sensors at the same time on different cylinders or different engines, without necessarily repositioning the same capacitive sensor or without using different diagnostic apparatus.

Please note: also D5 shows (figures 4A, 4B) a capacitive divider (76, 85) and a attenuating resistor (77, 84). The first circuit region could be identified in figure 4A of D5 as the connection from the sensors 71, 72 to the capacitor divider (76), meanwhile the second circuit region would be identified as the connection from the sensors 73, 74 to the capacitor divider (76).

Please note: the claim 17 of the present application fails to give a precise definition of first and second circuit regions. A circuit region could be a whatever part of a circuit, for example, also a circuit connection or one of its components.

Accordingly the skill man in the art, willing to improve the apparatus in D4 and to allow it to perform multiple measurements, would combine the feature of D4 to one of D5. In particular he would include a plurality of inputs instead a single input (as at point 9 of figure 3) and that without involving any inventive activity.

Please note: this consideration are independent from the fact that the capacitive sensor is a coil on plug capacitive sensor or clap type capacitive sensor.

The subject-matter of claim 17 is therefore not inventive (Article 33(3) PCT).

Dependent claims

6.1. The subject-matter of claim 2 in combination with claim 1 is considered inventive (Article 33(3) PCT), for the following reason.

The problem to be solved by the present invention may be regarded as attaching a capacitive sensor and adapting it for different types of ignition coil-on-plug ignition systems with a good repeatability. The solution of D1 offers an easy attachment of the capacitive sensor to the ignition system to be tested, but do not allow a firm and repeatable positioning (13, 21). The solution to this problem proposed in claim 2 of the present application, thank to its slot-groove construction, permits a precise and firm positioning of the capacitive sensor with a good repeatability. The two portions have only one degree of freedom (linear translation) and therefore it is easier for the user to place the capacitive sensor on the ignition system in a same convenient predetermined position, in order to obtain reliable measurements.

The subject-matter of claim 2 is therefore inventive (Article 33(3) PCT).

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/US2005/002687

- 6.2. Claims 3 to 9 are dependent on claim 2 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
- 6.3. Claims 11 to 16 are on the other hand not considered inventive because their additional features do not introduce novel or inventive feature to the holding mean in D3.
- 6.4. Claim 18 is also considered not inventive, because the addition of a switch in the circuit of D3 in order to selectively connect the different sensor is not considered inventive.
- 6.5. On the other hand, claim 19 is considered novel and inventive, because no features in the cited documents suggest the use of two potentiometers connected to the two circuit regions and selectively connected through two-positions switch. The claim is also considered inventive, since the use of the switch for selectively connecting two groups of capacitive sensors with two different circuit regions is not shown nor suggested by the cited prior art.
- 6.6. Please note: since claims 20 and 21 are combination of the previous claims 1, 10 and 17 (see also page 6, lines 5 to 7 of the present application), for these claims the same consideration of the 1, 10 and 17 are valid: therefore claims 20 and 21 are considered not novel and/or inventive.

Industrial applicability

7. The industrial applicability of the subject-matter claims 1 to 21 of the present application is evident (Article 33(4) PCT).